

CLAIMS

What is claimed is:

1. A cannula configured for providing an instrument access to the interior of a body,
5 comprising:
a shaft having a proximal end, a distal end, and a lumen extending between the proximal end and the distal end, the lumen configured for slidably housing the instrument;
an imaging window mounted on the distal end of the shaft; and
10 an imaging cable coupled to the imaging window, the imaging cable fixedly secured to the shaft.
2. The cannula of claim 1, further comprising:
one or more optical windows mounted on the distal end of the shaft; and
15 one or more optical cables coupled to the one or more optical windows, the one or more optical cables fixedly secured to the shaft.
3. The cannula of claim 2, wherein the one or more optical windows comprises a plurality of optical windows, and the one or more optical cables comprises a plurality of
20 optical cables.

4. The cannula of claim 1, wherein the shaft has a wall, and the imaging cable is housed within the wall.
5. The cannula of claim 2, wherein the shaft has a wall, and the imaging cable and
5 one or more optical cables are housed within the wall.
6. The cannula of claim 1, wherein the distal end of the shaft has a pre-shaped rectilinear geometry.
- 10 7. The cannula of claim 1, wherein the distal end of the shaft has a pre-shaped curvilinear geometry.
8. The cannula of claim 1, wherein the shaft has a cross-sectional dimension that is between 0.25 to 1.5 inches.
- 15 9. The cannula of claim 1, wherein the shaft is made from a malleable material.
10. The cannula of claim 1, wherein the distal end of the shaft is softer than the proximal end of the shaft.
- 20 11. The cannula of claim 1, further comprising a low-friction liner surrounding the lumen.

12. The cannula of claim 11, wherein the liner is made from a material selected from the group consisting of Teflon, PEEK, Polyimide, Nylon, and Polyethylene.

5 13. The cannula of claim 1, further comprising a stopper mounted to an exterior surface of the shaft.

14. The cannula of claim 13, wherein the stopper is fixedly secured to the exterior surface of the shaft.

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15. The cannula of claim 13, wherein the stopper is slidably secured to the exterior surface of the shaft.

16. The cannula of claim 13, wherein the stopper has a ring shape and is coaxially
15 surrounding the shaft.

17. A cannula assembly configured for providing an instrument access to the interior of a body, comprising:

a shaft having a proximal end, a distal end, and a lumen extending between the
20 proximal end and the distal end, the lumen configured for slidably housing the instrument;

an imaging window mounted on the distal end of the shaft;

an imaging cable coupled to the imaging window, the imaging cable fixedly
secured to the shaft; and

an imaging device coupled to the imaging cable.

5 18. The cannula assembly of claim 17, further comprising:

one or more optical windows mounted on the distal end of the shaft; and

one or more optical cables coupled to the one or more optical windows, the one or
more optical cables fixedly secured to the shaft.

10 19. The cannula assembly of claim 18, wherein the one or more optical windows
comprises a plurality of optical windows, and the one or more optical cables comprises a
plurality of optical cables.

20. The cannula assembly of claim 17, wherein the shaft has a wall, and the imaging
15 cable is housed within the wall.

21. The cannula assembly of claim 18, wherein the shaft has a wall, and the imaging
cable and one or more optical cables are housed within the wall.

20 22. The cannula assembly of claim 17, wherein the distal end of the shaft has a pre-
shaped rectilinear geometry.

23. The cannula assembly of claim 17, wherein the distal end of the shaft has a pre-shaped curvilinear geometry.
24. The cannula assembly of claim 17, further comprising a stopper mounted to an
5 exterior surface of the shaft.
25. The cannula assembly of claim 24, wherein the stopper is fixedly secured to the exterior surface of the shaft.
- 10 26. The cannula assembly of claim 24, wherein the stopper is slidably secured to the exterior surface of the shaft.
27. The cannula assembly of claim 24, wherein the stopper has a ring shape and is coaxially surrounding the shaft.
- 15 28. The cannula assembly of claim 17, wherein the imaging device comprises a charge coupled device (CCD) camera.
29. A cannula configured for providing an instrument access to the interior of a body,
20 comprising:

a shaft having a proximal end, a distal end, and a lumen extending between the proximal end and the distal end, the lumen configured for slidably housing the instrument;

one or more optical windows mounted on the distal end of the shaft; and

5 one or more optical cables coupled to the one or more optical windows, the one or more optical cables at least partially housed within a wall of the shaft.

30. The cannula of claim 29, further comprising:

an imaging window mounted on the distal end of the shaft; and

10 an imaging cable coupled to the imaging window, the imaging cable fixedly secured to the shaft.

31. The cannula of claim 29, wherein the one or more optical windows comprises a plurality of optical windows, and the one or more optical cables comprises a plurality of

15 optical cables.

32. The cannula of claim 29, wherein the distal end of the shaft has a pre-shaped rectilinear geometry.

20 33. The cannula of claim 29, wherein the distal end of the shaft has a pre-shaped curvilinear geometry.

34. The cannula of claim 29, further comprising a stopper mounted to an exterior surface of the shaft.

35. The cannula of claim 34, wherein the stopper is fixedly secured to the exterior
5 surface of the shaft.

36. The cannula of claim 34, wherein the stopper is slidably secured to the exterior surface of the shaft.

10 37. The cannula of claim 34, wherein the stopper has a ring shape and is coaxially surrounding the shaft.

38. A cannula assembly configured for providing an instrument access to the interior of a body, comprising:

15 a shaft having a proximal end, a distal end, and a lumen extending between the proximal end and the distal end, the lumen configured for slidably housing the instrument;

one or more optical windows mounted on the distal end of the shaft;

one or more optical cables coupled to the one or more optical windows, the one or
20 more optical cables at least partially housed within a wall of the shaft; and
an optical device coupled to the one or more optical cables.

39. The cannula assembly of claim 38, further comprising:
an imaging window mounted on the distal end of the shaft; and
an imaging cable coupled to the imaging window, the imaging cable fixedly
secured to the shaft.

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40. The cannula assembly of claim 38, wherein the one or more optical windows
comprises a plurality of optical windows, and the one or more optical cables comprises a
plurality of optical cables.

10 41. The cannula assembly of claim 38, wherein the distal end of the shaft has a pre-
shaped rectilinear geometry.

42. The cannula assembly of claim 38, wherein the distal end of the shaft has a pre-
shaped curvilinear geometry.

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43. The cannula assembly of claim 38, further comprising a stopper mounted to an
exterior surface of the shaft.

44. The cannula assembly of claim 43, wherein the stopper is fixedly secured to the
20 exterior surface of the shaft.

45. The cannula assembly of claim 43, wherein the stopper is slidably secured to the exterior surface of the shaft.
46. The cannula assembly of claim 43, wherein the stopper has a ring shape and is
5 coaxially surrounding the shaft.
47. The cannula assembly of claim 38, wherein the optical device comprises a light source.